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CLAIMS

- A method to induce stem cell differentiation in cardiomyocytes, wherein the cells are exposed for a period of time and in effective amounts to a protein of the EGF-CFC family or its derivatives, which comprises at least the EGF and CFC domains.
- 2. A method according to Claim 1 in which the EGF and CFC domains derive from the sequence of the Cripto protein.
- 3. A method according to Claim 2 in which the EGF and CFC domains derive from the sequence of human Cripto protein.
- 4. A method according to Claim 2 in which the EGF and CFC domains derive from the sequence of mouse Cripto protein.
 - 5. A method according to one of the preceding claims in which cell exposure occurs through genetic expression in stem cells via a suitable vector.
 - 6. Stem cells induced to differentiate into cardiomyocytes obtainable according to the method of one of previous claims.
 - 7. A composition for the treatment of heart diseases that comprises stem cells treated according to Claim 6.
 - 8. The use of the stem cells according to Claim 6 for the treatment of heart diseases.
- 9. A composition for therapeutic use for treating heart disorders that comprises a therapeutically effective amount of a protein or its derivative, having at least the EGF and CFC domains of a protein of the EGF-CFC family.
 - 10. A composition according to Claim 9 in which the protein has at least the EGF and CFC domains of the Cripto protein.
- 25 11. A composition according to Claim 9 in which the EGF and CFC domains derive from the human Cripto protein sequence.
 - 12. A composition according to Claim 9 in which the EGF and CFC domains derive from the mouse Cripto protein sequence.
- 13. A method to induce stem cell differentiation into neuronal cells, wherein the cells are exposed for a period of time and in effective amounts to an inhibitor of the Cripto protein or the engineering of the cells in such a manner that they do not express endogenous functioning Cripto.

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- 14. A method according to Claim 13 in which exposure to a Cripto inhibitor occurs in the early phases of stem cell differentiation.
- 15. A method according to Claim 13 in which the Cripto protein inhibitor is an anti-Cripto antibody or functional fragments thereof.
- 5 16. A method according to Claim 13 in which the Cripto protein inhibitor is a peptide specifically selected from a random combinatorial peptide library.

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- 17. A method according to Claim 13 in which the Cripto protein inhibitor is an antagonist of the Alq4(receptor)-Cripto(co-receptor)-Nodal(ligand) pathway.
- 18. A method according to Claim 17 in which the antagonist is the peptide Cerberus or its functional derivatives.
- 19. Stem cells induced to differentiate into neuronal cell lineages obtained according to one of the claims from 13 to 18.
- 20. A composition for the treatment of neuropathologies that comprises the stem cells according to Claim 19.
- 21. The use of the stem cells according to Claim 19 for treating neuropathologies.
 - 22. The use of the Cripto protein or its inhibitors in the preparation of a composition able to direct stem cell differentiation toward the neuronal lineage.